

In the Specification:

On page 1, after the title insert the following:

RELATED APPLICATIONS

This is a U.S. national stage of application No. PCT/DE2004/002477, filed on 09 November 2004.

This patent application claims the priority of German patent application no. 103 53 216.1 filed November 13, 2003, the disclosure content of which is hereby incorporated by reference.

FIELD OF THE INVENTION

On page 1, before line 13, insert the following heading:

BACKGROUND OF THE INVENTION

On page 1, amend the paragraph beginning on line 13 as follows:

Such a laser device and a production method therefore is known from US Patent No. 6,954,479 ~~the printed document WO 01/93386~~, the content of which is incorporated herewith in the present description by reference. An optically pumped surface-emitting semiconductor laser device comprising an amplifier region as vertical emitter region and at least one edge-emitting semiconductor laser as pump radiation source is described. The vertical emitter region and the pump radiation source are grown epitaxially on a common substrate. This makes it possible to achieve a space-saving monolithically integrated arrangement of vertical emitter region and pump radiation sources.

On page 3, before line 18, insert the following heading:

SUMMARY OF THE INVENTION

On page 3, delete the paragraph beginning on line 23 through line 26 in its entirety.

On page 3, amend the paragraph beginning on line 28, as follows:

According to the invention, the This and other objects are attained in accordance with one aspect of the present invention directed to a semiconductor laser device comprising an optically pumped surface-emitting vertical emitter region which has an active radiation-emitting vertical emitter layer, and at least one monolithically integrated pump radiation source for optically pumping the vertical emitter, which has an active radiation-emitting pump layer. The pump layer follows the vertical emitter layer in the vertical direction, and a conductive layer is provided between the vertical emitter layer and the pump layer. Furthermore, a contact is applied on the side of the semiconductor laser device which is closer to the pump layer than to the conductive layer. An electrical field can be applied between this contact and the conductive layer for generating pump radiation by charge carrier injection.

On page 4, amend the paragraph beginning on line 19 as follows:

The semiconductor laser device is preferably partially ablated so that the conductive layer is partially exposed. In one embodiment of the invention, the semiconductor laser device can be ablated in the form of parallel trenches. It is particularly preferred if a further contact for contacting this conductive layer is applied to the exposed regions of the conductive layer. In another embodiment of the invention, a layer which is electrically conductive and which is transparent for radiation of a wavelength as generated by the ~~vertical emitter region pump radiation source~~ is provided between the conductive layer and the further contact.

On page 7, delete the paragraph beginning on line 4 through line 7, in its entirety.

On page 7, before line 9, insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 8, before line 21, insert the following heading:

DETAILED DESCRIPTION OF THE DRAWINGS

On page 9, amend the paragraph beginning on line 20 as follows:

Within the vertical emitter region 2, the semiconductor laser device has a vertical waveguide structure 16 which vertically follows the conductive layer 13 on the side facing away from substrate 8, and which the vertical structure 16 contains an etch stop layer 17 besides and the vertical emitter layer 3. In addition, a window 18 is provided which bounds the vertical emitter region 2 on the side facing away from the substrate 8 and through which the radiation field 4 can leave the semiconductor body 1.

On page 14, amend the paragraph beginning on line 25 through page 15, line 2, as follows:

The second measure consists in providing a better vertical waveguide for the pump radiation in the vertical emitter region 2 than in the region of the pump radiation sources 5. For this purpose, a part of the vertical waveguide structure 16 is constructed as periodic waveguide layer structure 20 shown in Fig. 5 which is a sectional view taken along line BB in Fig. 3 (RPG - resonant periodic gain). In a semiconductor laser device based on the system of materials AlInGaAsP, the periodic waveguide layer structure 20 can have, for example, AlGaAs layers with high aluminum content. Such layers with high aluminum content can be oxidized through from the side of the semiconductor body 1 in a defined manner to the transition region between pump laser structures 5 and vertical emitter region 2 by a wet-chemical oxidation method as a result of which the index of refraction can be changed by up to about 50% in the oxidized region.

On page 15, amend the paragraph beginning on line 16 as follows:

As mentioned above, Figure 5 shows a diagrammatic sectional view of the second exemplary embodiment along line BB.